CLAIMS

1. A lithium-nickel-cobalt-manganese-containing composite oxide represented by a general formula, $Li_pNi_xMn_{1-x-y}Co_yO_{2-q}F_q$ (where $0.98 \leqq p \leqq 1.07$, $0.3 \leqq x \leqq 0.5$, $0.1 \leqq y \leqq 0.38$, and $0 \leqq q \leqq 0.05$), formed by synthesizing coagulated particles of a nickel-cobalt-manganese composite hydroxide wherein primary particles obtained by precipitating the nickel-cobalt-manganese composite hydroxide are coagulated to form secondary particles, by supplying an aqueous solution of a nickel-cobalt-manganese salt, an aqueous solution of an alkali-metal hydroxide and an ammonium-ion donor continuously or intermittently to a reaction system, and making the reaction proceed in the state wherein the temperature of said reaction system is substantially constant within a range between 30 and 70℃, and pH is maintained at a substantially constant value within a range between 10 and 13; synthesizing coagulated particles of a nickel-cobalt-manganese composite oxyhydroxide by making an oxidant act on said coagulated composite hydroxide particles; and dry-blending at least said composite oxyhydroxide and a lithium salt, and firing the mixture in an oxygen-containing atmosphere.

2. The lithium-nickel-cobalt-manganese-containing composite oxide according to claim 1, characterized in that the density of the compressed powder is 2.6 g/cm^2 or more.

3. The lithium-nickel-cobalt-manganese-containing composite oxide according to claim 1 or 2, characterized in having an R-3m rhombohedral structure.

4. A method for manufacturing a lithium-nickel-cobalt-manganese-containing composite oxide represented by a general formula, $Li_pNi_xMn_{1-x-y}Co_yO_{2-q}F_q$ (where $0.98 \leqq p \leqq 1.07$, $0.3 \leqq x \leqq 0.5$, $0.1 \leqq y \leqq 0.38$, and $0 \leqq q \leqq 0.05$) according to any one of claims 1 to 3, comprising:

a step for synthesizing coagulated particles of a nickel-cobalt-manganese

composite hydroxide wherein primary particles obtained by precipitating the nickel-cobalt-manganese composite hydroxide are coagulated to form secondary particles, by supplying an aqueous solution of a nickel-cobalt-manganese salt, an aqueous solution of an alkali-metal hydroxide and an ammonium-ion donor continuously or intermittently to a reaction system, and making the reaction proceed in the state wherein the temperature of said reaction system is substantially constant within a range between 30 and 70℃, and pH is maintained at a substantially constant value within a range between 10 and 13;

a step for synthesizing coagulated particles of a nickel-cobalt-manganese composite oxyhydroxide by making an oxidant act on said coagulated composite hydroxide particles; and

a step for dry-blending at least said coagulated composite oxyhydroxide particles and a lithium salt, and firing the mixture in an oxygen-containing atmosphere.

5. The method for manufacturing a lithium-nickel-cobalt-manganese-containing composite oxide according to claim 4, wherein the lithium salt is lithium carbonate.

6. A material for a positive electrode active material for a lithium secondary cell consisting of coagulated particles of a nickel-cobalt-manganese composite oxyhydroxide represented by a general formula, $Ni_xMn_{1-x-y}Co_yOOH$ (where $0.3 \leqq x \leqq 0.5$, and $0.1 \leqq y \leqq 0.38$), formed by synthesizing coagulated particles of a nickel-cobalt-manganese composite hydroxide wherein primary particles obtained by precipitating the nickel-cobalt-manganese composite hydroxide are coagulated to form secondary particles, by supplying an aqueous solution of a nickel-cobalt-manganese salt, an aqueous solution of an alkali-metal hydroxide and an ammonium-ion donor continuously or intermittently to a reaction system, and making the reaction proceed in the state wherein the temperature of said reaction system is substantially constant within a range between 30 and 70℃, and

pH is maintained at a substantially constant value within a range between 10 and 13; and making an oxidant act on said coagulated composite hydroxide particles.

7. The material for a positive electrode active material for a lithium secondary cell according to claim 6, characterized in that the specific surface area is 4 to 30 m^2/g.

8. The material for a positive electrode active material for a lithium secondary cell according to claim 6 or 7, characterized in that the density of the compressed powder is 2.0 g/cm^2 or more.

9. The material for a positive electrode active material for a lithium secondary cell according to claim 6, 7 or 8, characterized in that the half-value width of the diffraction peak when 2θ is $19 \pm 1°$ in X-ray diffraction using Cu-Kα lines is 0.3 to 0.5°.

10. A method for manufacturing the material for a positive electrode active material for a lithium secondary cell represented by a general formula, $Ni_xMn_{1-x-y}Co_yOOH$ (where $0.3 \leqq x \leqq 0.5$, and $0.1 \leqq y \leqq 0.38$), according to any one of claims 6 to 9, comprising:

a step for synthesizing coagulated particles of a nickel-cobalt-manganese composite hydroxide wherein primary particles obtained by precipitating the nickel-cobalt-manganese composite hydroxide are coagulated to form secondary particles, by supplying an aqueous solution of a nickel-cobalt-manganese salt, an aqueous solution of an alkali-metal hydroxide and an ammonium-ion donor continuously or intermittently to a reaction system, and making the reaction proceed in the state wherein the temperature of said reaction system is substantially constant within a range between 30 and 70℃, and pH is maintained at a substantially constant value within a range between 10 and 13; and

a step for synthesizing coagulated particles of a nickel-cobalt-manganese

composite oxyhydroxide by making an oxidant act on said coagulated composite hydroxide particles.